RF

ORANGE COUNTY AMATEUR RADIO CLUB, INC.

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The Prez Sez.....

By Dan KI6X

One thing you can say about Hams is that they are resourceful communicators. We communicate with whatever method we can.

100 years ago it would have been only RF (radio frequency) via CW (Morse code) or letter via postal service or maybe an expensive phone call if not in person. Now we can use RF (HF, VHF, UHF) via CW, Voice, and many Digital modes. We can use digital modes that can incorporate the internet along with radio (DSTAR, DMR, Smoke Signals, Fusion, Echolink, etc.), or even use the internet itself without RF (email, Zoom, WebEx, Skype, etc.). You can still use the phone (probably the one in your pocket or implanted in your head right now) and you could even still use the post orifice. Any way you communicate you can get information passed. That is Ham Spirit.

In this time of general isolation we have been using all the various ways to communicate to keep in touch with each other. As a club we have sent more emails lately and held an internet (Zoom based) Board meeting. We will use these methods as we need to, but we do want to get back in person and I look forward to that day.

My two years as President has seen a lot of needed alternate planning for meetings. We had general meetings at a restaurant in the fall while the Red Cross was being refurbished, and now we cancelled the March meeting and are planning a Zoom video on-line meeting for April 17 with an interesting presentation. Keep an eye out for the information in this "RF" and via an email blast before the meeting.

Our Field Day effort is unknown at this time as well as May meetings and beyond. The Covid-19 situation and government recommendations are fluid so we will decide as events arise. Please contact me or a Board member (see email addresses on page 2) if you have questions or needs.

Dan, KI6X, President

NEXT MEETING
April 17, 2020
7PM
ONLINE ZOOM
OCARC Virtual Meeting on "END- FED one-half-wave antennas"
– byTerrence AI6ZV
All current members will receive an email invite
DURING THE CORONAVIRUS (COVID-19)
All OCARC Nets Remain Active!

In This Issue

The Prez Sez 1
Club Information 2
Dues are due now 3
RadioActivity Opportunities 4
Corona Virus explained 5
Corey's Recipe 9
Board Meeting Minutes 10
Radio and the Afterlife 12
The Heath Kit Parasol 13
OCARC Cash Flow Statement 26
Ad for MiniTiouner-Express DATV 27

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Monthly Events:

General Meeting time & location:
REGULAR MEETINGS are CANCELLED until further notice
Normally Held third Friday of the month at 7PM, located at
The American Red Cross
600 Parkcenter Drive
Santa Ana, CA
(Near Tustin Ave. & 4th St.)
For more information see below.

Club Breakfast (Board Mtg) info:
Held the First Saturday* of the month at 8am
Marie Callender's Restaurant
307 E. Katella Ave
Orange, CA 92867
*Temporarily cancelled

Club Nets (Listen for W6ZE):

10M: 28.375 ± MHz SSB
Wed- 7:30 PM - 8:30 PM
Net Control: Corey, KE6YHX

2M: 146.55 MHz Simplex FM
Mon, Wed, Fri 8:30 PM - 9:00 PM Local time
Net Control: Corey, KE6YHX

75M 3.883 MHz LSB
Wed ~9:15 PM
Follows right after end of 2M Net
Net Control: Corey, KE6YHX,
Follows right after end of 2M Net
Corey, KE6YHX, Net Control

2020 OCARC DUES
ARE NOW DUE
PAY DUES ONLINE
OR IN PERSON
by W6ETC

RadioActivity
April 2020

Upcoming Activities:

APRIL

- **Sausage Eating Contest**: Wednesday April 1, 3200 UTC to 4800 QRT.
- **ARRL Rookie Roundup SSB:** Sunday April 19, 1800 UTC through 2359 UTC.
- **10-10 International Spring Contest/Digital:** 0001 UTC Saturday April 25 through 2359 UTC Sunday April 26
- **Helvetia Contest:** 1300 UTC Saturday April 25 to 1259 UTC Sunday April 26

May

- **7TH Call Area QSO Party:** 1300 UTC Saturday May 2 through 0700 UTC Sunday May 3
- **10-10 International Spring Contest/CW:** 0001 UTC Saturday May 2 through 2359 UTC Sunday May 3
- **FISTS Spring Slow Speed Sprint:** 1700 UTC through 2100 UTC Sunday May 2
- **FISTS Spring Unlimited Sprint:** 1700 UTC through 2100 UTC Sunday May 9
- ***CQ World Wide WPX Contest/CW:** 0000 UTC Saturday May 30 through 2359 UTC Sunday May 31

* Indicates club entries are accepted
** Indicates team entries are accepted
Note: When submitting logs for ARRL Contests indicate your club affiliation as "Orange County ARC"

State QSO Parties:

- **Georgia QSO Party:** 1600 UTC Saturday April 11 to 0400 UTC Sunday April 12
- **North Dakota QSO Party:** 1800 UTC Saturday April 11 to 1800 UTC Sunday April 12
- **Michigan QSO Party:** 1600 UTC Saturday April 18 to 0400 UTC Sunday April 19
- **Florida QSO Party:** 1600 UTC Saturday April 25 to 0159 UTC Sunday April 26 and 1200 to 2159 UTC Sunday April 26
- **Indiana QSO Party:** 1500 UTC Saturday May 2 to 0300 UTC Sunday May 3
- **Delaware QSO Party:** 1700 UTC Saturday May 2 to 2359 UTC Sunday May 3
- **New England QSO Party:** 2000 UTC May 2 Saturday to 2400 UTC Sunday May 3
- **Arkansas QSO Party:** 1400 UTC Saturday May 10 to 0200 UTC Sunday May 11

Ongoing Activities:

- **Super QP Challenge:** Year Long Event 0000 UTC Jan. 1 to 2400 UTC Dec. 31

Repeating Activities:

- **Phone Fry** Every Tuesday night at 0230Z to 0300Z
- **SKCC** Weekend Sprintathon (Straight Key CW) on the first weekend of the month after the 6TH of the month. 1200 Sat. to 2359Z Sunday.
- **SKCC** Sprint (Straight Key CW) 0000Z to 0200Z on the 4th Tuesday night (USA) of the month.
- **CWops** Every Wednesday 1300 UTC to 1400 UTC 1900 UTC to 2000 UTC and Thursday 0300 UTC to 0400 UTC

Send an email to *Ron W6WG, w6wg@w6ze.org to have your favorite activity or your recent RadioActivity listed in next month's column.*

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Hams are getting some good publicity for nets like ours.

This is a good article.

https://www.newsobserver.com/news/coronavirus/article241608001.html

DE Tim N6GP

CORONAVIRUS EXPLAINED

By AF6CF

I'm not a Medical Doctor and I don't even play one on TV. However, I have been present for over 70 rotations of the Earth around the Sun and have been cursed with good memory, so I have an opinion about the current situation that I would like to share.

Let me tell you, this is neither the first nor the last virus to affect mankind. There have been numerous virus and bacteria epidemics in the past, hundreds or maybe even thousands.

So this is really not new. As an example, we had Smallpox, Polio, Rabies, SARS, Ebola, HIV, Influenza and many, many more. Some of them unknown to the general public, but still there. All these share a common trait and evolution so the medical profession has more or less discovered the best way to handle these pests.

Long time ago, there was no knowledge on how to avoid these and the transmission mechanisms were uncertain. During the middle ages, rats would carry many terrible plagues and disease and people would have no idea where they came from. Indoor plumbing and sanitation is credited with saving more lives than all the previous efforts combined.

Viruses are very small; they can not be seen with the naked eye or even in a conventional microscope that would show most bacteria. They are tiny but very aggressive.

So how do viruses work? Well, a simplistic explanation would be to compare the biological viruses with those affecting computers. By definition, a virus is an entity capable of replicating itself. So a computer virus will reproduce itself into the computer's memory many, many times until the memory is so full that the computer ceases working.

Similarly, a biological virus would penetrate inside the human cells and reproduce itself; this would deplete the cell of some of its needed components and provoke a violent reaction. Depending on the particular virus, this reaction can take many forms, from producing fever, liquids like mucus or the walls of the cell may just explode under the pressure created by the virus or its reaction.

When I was a kid, I got bitten by dogs more than once and in all occasions I would live in terror for the next month waiting for my mouth to start foaming just before I would die. Fortunately that did not happen and thanks to Dr. Louis Pasteur my worries more or less disappeared and also we can drink milk safely. Then there was the Polio epidemic and again thanks to Dr. Jonas Salk the threat of getting into an "Iron Lung" (nowadays called ventilators) and dying went away. And I'm one of the few people I know that has received the Smallpox vaccine.

All viruses have a "mortality rate" defined as the percentage of people that will die as opposed to the ones that will survive. This rate is obviously impacted by the available treatments and countermeasures. Another effect of most infections is that the survivors will have "antibodies" in their blood that will, in many cases prevent another infection.

Vaccines are based in this principle, and by injecting us with a milder or attenuated form of the virus, our bodies will create the antibodies that will make us immune from an infection in the future. Some

viruses, notably the Influenza will mutate to try to escape this countermeasure, so that's the reason why this year's vaccine is not good for the next Influenza season.

So far, in all cases the medical profession has been able to find a countermeasure, a cure or in some cases, eradicate the virus completely.

Before we get into the current COVID-19 situation, let me give two extreme examples of what we are dealing with.

1) Ebola - a fast killer
2) HIV - a slow killer

These are two lethal but very different infections. Both can kill you but in their own way. The present COVID-19 virus will fall somewhere in between these two.

Ebola:

The Ebola virus is named after a river in Africa where it was first discovered. This virus is so powerful and deadly that can kill almost anybody in a very short time. It will make your internal organs bleed to death. So you may ask how come it did not wipe out all of us humans?

Very simple, it kills you so quickly that this would limit its spread to a small area. The virus cannot spread if the carriers are dead.
Yes, I know that there were countermeasures, vaccines, etc but we are looking from the point of view of the virus and its effects, not at its history.

HIV:

The Human Inmunodeficient Virus was a very difficult case to crack because of its very slow evolution. Basically, instead of killing you directly, the virus makes your immune system weaker, and then any minor, banal infection or disease kills you because your body has no defenses. Being a "weak" agent, it will not present symptoms of its own and can be spread and carried without the person's knowledge.

When I was young, several grown-ups told me that homosexuals very often developed strange illnesses and died shortly thereafter. My take on this was "They say that so I'll stay away from gay people".

However, twenty years later many of the people in that group started dying of a variety of illnesses that were uncommon or unheard of, like weird forms of cancer that normally would not be a big deal or they would catch a common cold and die from it at an age that it made no sense. Finally the HIV virus was detected and once understood, treated.

COVID-19:

The COVID-19 or Coronavirus seems to be a distant cousin of the Influenza strain and has its own characteristics, many of them unknown at the present time.

One thing is for sure; it's extremely contagious and can spread rapidly all over the globe. But its mortality rate is still under discussion because we don't know how many of us have contracted it vs. how many have died from it.

By the way, most if not the all people that have died due to the Coronavirus had "Preexisting Conditions" like Diabetes, Lung issues, Heart Disease, etc so the virus just triggered their demise in an indirect way. Most of us have some condition or another without even being aware of it.

Early on, it was said that only old people (over 65) would die from it. This is totally bogus. Old people die of old age. You can die at any age from any number of causes. Granted, the older you are the more chances you have of having one of those "Preexisting Conditions" simply because you have lived long enough to acquire them.

So far, people without any preexisting conditions have totally recovered, so this begs the question: Is this virus really bad or it's just going to get rid of the otherwise weak?

Charles Darwin survival of the fittest at its best. But he cannot answer, he's dead too.

We'll have all the answers given time; it takes at least a year to develop a vaccine and even more time to distribute it to a sizable portion of the population. I took Dr Salk three years from inception to public release of the Polio vaccine (1952 to 1955).

So, what makes this one virus so different from all the others?

Nothing. The difference is that nowadays we have what is called "The Media", TV and social networks that thrive in mass hysteria with daily statements and figures that don't make any sense.

This could be both good and bad. Bad because they create unnecessary stress and panic on the population. Good because they enhance the awareness needed to respect the dire measures necessary to mitigate the spread of the disease.

In the past, we had a timeline that would finally take us to conquer the virus and I'm convinced that the same hold true for this one. We may not know the timeline yet, but with the concerted effort of the medical community this could be much sooner than later.

After all, we humans are bigger than viruses.

Most governments around the world are seeing this pandemic as a way to bolster their grip on power and to curtail individual liberties even further. Some will distort the casualty numbers in an effort to boost their image, so we have to take their information with a grain of salt.

In the Middle Ages, if somebody had a fever or some kind of illness, they tried to cure it with absurd means, like applying leeches to the back of the sick on the belief that they would extract the blood that was "bad" and thus curing the disease. Most of those methods were ineffective because there was no knowledge of cause and effect, some may have worked but nobody knew why.

The measures taken to mitigate this Coronavirus outbreak are probably the most extreme we have seen in our lifetime. We have frozen the global economy and possibly created such a global disruption that could potentially kill as many people as the virus.

But do not despair, we see alarming numbers in the TV screen and get the sensation that the end of mankind is near. Not really, it's estimated that Smallpox has killed 300 million people just in the 20th century alone but nowadays it's only a memory in the brains of a few. And we are now several billons.

The numbers on the TV screen are puny in comparison.

So what can we do?

For one thing, stay calm. Suicide doesn't help survival.

Follow the indications of the medical community; most of them know what they are talking about.

Stay indoors and avoid contact with strangers (my mother always told me this).

Use common sense in your daily activities, if you must go out use a mask and gloves.

All this is to avoid getting the virus, but what about immunity? You'll never get immunity if you don't get sick, right?

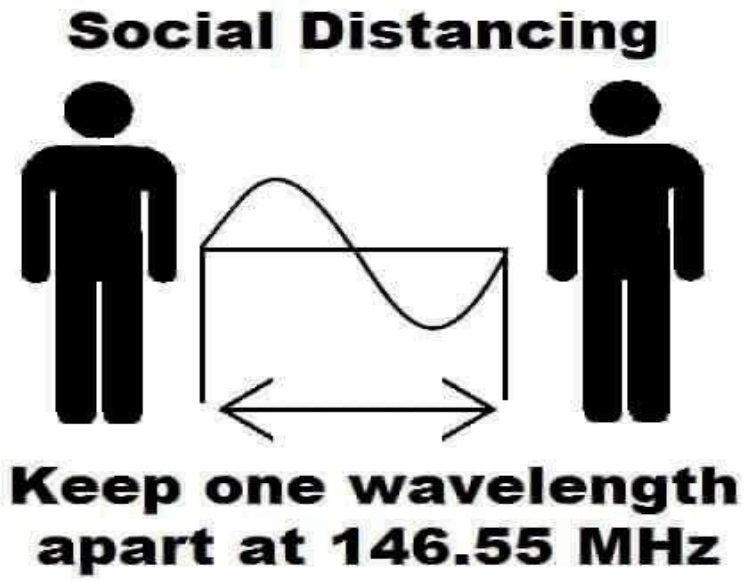
Correct, but since none of us is certain about the outcome if we get infected it's far better to wait until there is a vaccine than to play Russian roulette with your life.

In closing, I have bad news and good news.

Bad news is that we all are going to die.
Good news is that it will not happen today.

So CARPE DIEM!

The preceding text is only the opinion of one individual and it does not reflect the opinions or policies of the Orange County Amateur Radio Club and/or its members.



Corey's Crouton Recipe

Ingredients	Equipment
(Double for 2 batches.) • 1/2 loaf day-old bread from a breadmaker • 4 tablespoons (1/2 stick) unsalted butter • 1/2 teaspoon garlic salt • 2 tablespoons (1oz) olive oil • 1 teaspoon dried oregano	• 10 oz. sealable, microwaveable container • measuring spoons • small whisk • bread knife and cutting board • large bowl • baking sheet • flashlight • oven mitts • large zip-top bag

Directions

•Microwave and melt the butter and garlic salt together in a microwaveable container 25 seconds* and stir.
•Whisk-in the olive oil and oregano.
•Seal and refrigerate until needed.
•Remove lid and reheat in microwave 35 seconds* then stir.
*Microwave times may vary.

•Preheat the oven to 350°F.
•Slice the day-old bread into half-inch cubes.
•Put 2 heaping cups of the bread cubes in a large bowl.
•Stir then drizzle 1/2 the mixture around the sides of the bowl, while tossing the bread cubes to coat.
•Pick up the cubes of bread and spread in a single layer on 1/2 of a baking sheet.
•Put 2 more heaping cups of the bread cubes in the bowl.
•Stir then drizzle the other 1/2 of the mixture around the sides of the bowl, while tossing the bread cubes to coat.
•Pick up the cubes of bread and spread in a single layer on the other 1/2 of the baking sheet, with space in the middle of the baking sheet.

•(Repeat for the other 1/2 loaf, another batch of oil mixture, and a second baking sheet.)

•Bake until golden brown and toasted, 25 to 35 minutes.
•The oil mixture may be sizzling when the trays are pulled out of the oven, but it should dry as the croutons cool.
•Allow to cool in the baking sheet on a wire rack for 15 to 20 minutes.
•Move to a large zip-top bag, and keep at room temperature for up to a week. Discard bag after use.

Eat everything and keep social distance.

OCARC
BOARD MEETING MINUTES
2020-04-04

Due the COVID-19 restrictions and lack of deodorant, the OCARC Board meeting was held **ON-LINE via ZOOM** on Saturday April 04, 2020 at 8:00 AM. In attendance were 10 Directors and one visitor. All of the directors were present for a Board quarrel. The ZOOM technology (organized by Tim N6TMT) worked very well and allowed the board to see agendas and reports as well as to see which board member was a talking head.

Screen-shot of April Board Meeting held on Zoom
Due to CoronaVirus health restrictions

Director Reports:

- **Membership** – Corey KE6YHX reported that the club has a total of 76 members who have paid their 2020 membership.
- **Treasury - Greg** W6ATB reported that the club had a net income of $707, Year-to-Date. See Newsletter Page 26 for a cash flow of the club's finances.

Old Business:

- **Newsletter Editors**
  Apr – Nikolas AF6CF
  May – Jimmy AF6N
  June – Greggy W6ATB
  July – Ronnie W6WG

General Meeting Programs

Because of COVID-19 restrictions, the Board has agreed to attempt a ZOOM General Meeting in April open to all OCARC members.
April – **ONLINE ZOOM** on End-Fed one-half-wave antennas – Terrence AI6ZV
May – May be ZOOM??? Could be Bob Turner on ARRL ARES or HF Portable operation by Nicholas AF6CF
June - meeting subject will be Field Day, but the speaker is yet to be selected.
Sept – Test Equipment by Doug Millar K6JEY.

• Summer Field Day
Tim N6GP reported that the ARRL has not made a decision on **if/how** to hold FD this year because of the Corona Virus health restrictions. One ARRL discussion being circulated is that club members should practice FD from their back yards. The board members kicked around the idea of several 2-person tents set up in a large field.
We still have no "chairman" for FD.

• Storage Locker move
The club is still planning to move the club's equipment to a "one–car space" garage in Yorba Linda owned by the mother of Tim N6TMT. Complications of summer FD planning from COVID-19 has impacted the exact date of equipment moving.

• ARRL Special Service Club designation
Club secretary, Ken is working on renewing the OCARC's ARRL Special Service Club designation.

• Two new OCARC 2M Nets
Corey KE6YHX, the primary net control station for OCARC nets, has added two new weekly 2M nets to focus primarily on service and support during the CoronaVirus health-threats and restrictions. The two nets are to be called the "OCARC Coronavirus Support net" to meet each Monday and Friday on 146.550 MHz (simplex) at 8:30 PM.

New Business:

• California QSO Party planning
Ron W6WG suggested that **IF** summer field day plans fall apart because of COVID-19 restrictions, then perhaps the OCARC can organize a full blown club participation for the fall CA QSO PARTY with each member operating from his home station or back yard.

• CARA "Nets at Nine" 2M Nets
Tom W6ETC reported that CARA (Catalina) repeater (147.090+) is being used to operate a new support net (Net at Nine) for hams M-F at 9 AM and 9 PM during the Coronavirus restrictions. Several OP's asked on the air at what time the Net started.

• OCARC Website Nets page
Bob AF6C reported that the OCARC NETS INFO on our website was broken and has been taken down while repairs are made, including oil changes.

Submitted by Ken W6HHC, OCARC Secretary
Distorted by the Editor.

HAM Radio and the Afterlife

Because of the COVID-19 situation, many of us started talking about deep theological and philosophical issues. One recurring theme was what happens when you die. Does your soul go somewhere? Does it stay in an invisible form? Do you go to heaven?

This is not a new conversation; the subject is discussed in churches almost every day, and there have been Hollywood movies about people communicating via radio with the deceased, for example the year 2000 movie “Frequency”.

In the non-HAM radio community, many believe that we routinely talk with other planets, UFO’s and a host of other absurd ideas.

To put the issue definitively at rest, two old friends decided that they will find out for once and all if there is HAM radio in the afterlife or not.

Their plan was very simple, they made a pact and made an oath to each other that whoever dies first will come back from the dead to tell the surviving one if there was Radio or not.

To conceal their identities, I will call one of them Ken and the other Bob.

So one tragic day, Bob lost his life. Ken was devastated, but hoped that Bob would keep his side of the pact.

A few weeks later, in the middle of the night, Ken heard an eerie voice calling his name.

Totally awake now, he asked: Is that you, Bob?

-Yes. Was the answer
-So? Is there HAM Radio in the afterlife?

Bob answered: Well. I have good news and bad news…

So Ken said: Give me the good news.

- The good news is that certainly there is Radio in the afterlife.
- That’s fantastic good news! There cannot be bad news then!

Bob replied: The bad news is that you’ll be Net Control this Sunday at 6 AM.

Heathkit of the Month #100:
by Bob Eckweiler, AF6C

Heathkit History
The Heath Kit *Parasol*

Introduction:

It's April, the month of April Fools day, and to celebrate I like to present an unusual Heath-kit. This April will be no exception.

In honor of the 100th *Heathkit of the Month* article, we'll cover the first Heath kit. Everyone who follows the column knows the first Heathkit was the O-1 Oscilloscope. But we are not talking about that kit. We are talking about the first real Heath kit (notice it is two words). Even before Howard Anthony announced the first Heathkit oscilloscope in 1947, the Heath Company, produced kits, which Heath initially called "knockdowns". Before discussing the Heath ***Parasol***, (**Figure 1)** which was introduced in late 1926,

Here is a link to the index of Heathkit of the Month (HotM) articles:

http://www.w6ze.org/Heathkit/Heathkit_Index.html

FIGURE 1: Heath ***V Parasol*** Airplane at Wisconsin Oshkosh Airshow in 2003. Photo by FlugKerl2 [1]

let's take a look at the early Heath Company and its founder Edward Bayard[2] Heath.

Edward Bayard Heath (1888 - 1931):

Edward Heath **(Figure 2)** was born on Long Island, N.Y. His father died when he was three, and his mother later remarried, moving

FIGURE 2: Five foot-one inch tall Edward Bayard Heath. Photo: Wikipedia Commons [3]

FIGURE 3: A young Ed Heath at the controls of the first airplane he built. (From an early Heath ad.)

upstate to Amsterdam, N.Y. where both families had relatives. They ended up traveling around the country a lot, likely because Ed's stepdad was reportedly a machine parts salesman. Ed attended many schools as he was growing up, including the excellent Lane Technical School in Chicago, where he met the woman he would later marry, and where he learned a lot about aviation. Heath was a voracious reader, especially of technical literature. As an adult Heath was small in stature, standing just over 5' tall and weighing on the order of 110 lbs. His size and weight would later influence some of his aircraft designs.

The history of his first airplane and his first flight has become muddled over the years. What is known is that he returned to Amsterdam, N.Y. in early 1909 or 1910 and started construction on his first airplane which looked similar in design to the French Blériot XI **(Figure 3)**; the plans for which had then been recently published. Another known is that his first attempt at flight took place at the nearby Antlers Country Club.

According to Chet Peek in his book *The Heath Story* [4], the first attempt at flight took place on Monday September 12, 1910 and resulted in the plane never leaving the ground and suffering from a collapsed landing gear at the end. An article in the Amsterdam Evening Recorder newspaper [5] states":

"Just when it seemed the monoplane was about to leave the ground, one of the posts supporting the upper portion and the left wing gave way allowing the wing to drop. Driver [sic] *Heath immediately shut off the engine."*

A second attempt then took place on Sunday October 9th, 1910 near Fonda, N.Y. About 9½ miles west of Amsterdam. This attempt again failed with the plane not leaving the ground, but instead *"one of the wings got caught in some manner"* according to the Fonda Democrat [6], This ended his attempt to fly in the Amsterdam area.

Ed Heath's mother and business partner, however told a different story of Ed Heath's first flying experiences in a memorial article. The article *"The Edward Heath Memorial Completed"* that appeared after Ed Heath's death in the December 1931 issue of ***Popular Aviation***, page 86, states:

"[The first flight] *took place on October 10, 1909, at The Antlers Club. Amsterdam, N.Y. – a flight lasting about 40 seconds and about one-half mile in length. He took off from a hillside, and on landing broke the left side of the landing gear. After making the necessary repairs, he made a second flight on November 2, 1909, starting from the Fonda Fair Grounds* [race track]. *About all of the home-stretch, or one-third mile, was used in taking off, and he just cleared the fence at the end of the track. This was a straight-away flight of sixty-five seconds' duration that also covered about one-half mile. The landing was made in rough ground, where the landing gear was again broken and, in addition, the propeller was damaged."*

These two versions are similar except for the dates. Peek comments that this was the end of Heath's flying in the Amsterdam area, Heath's mother adds that he put his plane in

storage and began working for the Curtiss company (builder of the famous WWI Jenny plane) at Hammondsport in western N.Y. There he met Walter Eales, who had built a Curtiss type airplane, but was lacking an engine. Heath and Eales were able to obtain an engine and they took turns successfully flying the plane. Heath later sold his interest in Eales plane and returned to Amsterdam to repair his original plane. His uncle had made a deal for Heath and his airplane to make a static display appearance at an event in nearby Gloverville, N.Y.

Ed Heath only worked for Curtiss for a short time. In his teens Heath had made a name for himself racing motorcycles and once raced against Glenn Curtiss, so he ended up in their motorcycle division, instead of the desired aviation division. He was soon back in Chicago where in 1911 he purchased the Bates Aeroplane Company which he renamed the .E.B. Heath Aerial Vehicle Company.

The E.B. Heath Aerial Vehicle Company

Little history can be found about the early E.B. Heath company years up to and including WWI. By 1913 Heath had developed a second airplane, the ***2B*** biplane. It was available with both regular landing gear ($1,400) or with floats for use on water ($1,500). The company was heavily into making aircraft parts and carving propellers. Supplying the war effort during WWI was a majority of their business. Sometime along the way the company name was changed to the Heath Airplane Company.

The 1919 Heath catalog lists a series of "knockdown" aircraft for sale. They are listed in Table I. By "knockdown it appears the planes were assembled in Heath's factory and then disassembled and crated for shipping. Instead of buying a "knockdown" you could buy a "list of parts" which was basically the raw material to build and assemble the plane. These aircraft were expensive and probably were not viable for the general population. Heath dreamed of making available a plane that the average Joe could afford and fly safely. He knew that this would add revenue to his company. Heath already had started a flying school, where people PAID to work in his factory, and their time working would go towards flight time in one of Heath's trainer airplanes. The rate works out close to one minute of flight time for each one hour worked in the factory. Working times were were 6½ hours, five day-a-week. Which resulted in about 30 minutes of flight time per week. While this sounds bad, the factory work was also part of the school, teaching aircraft mechanics and construction. (See **Figure 4**)

1n 1919 Ed Heath designed and built his ***Feather*** [7] biplane, designated the MA-2. It was his first ultralight airplane. This was a single place plane with a wingspan of 20' and weighing 270 lbs. The engine was a two cylinder Thor motorcycle engine modified by Heath's company. With 76 cu. in. and 18

SOME OF THE AEROPLANES LISTED IN THE 1919 HEATH CATALOG

MODEL	PRICE
Heath Glider	**$90.00**
Tail extra (if desired)	20.00
Complete, list of parts	42.00
Heath Motorcycle Model Biplane	**$700.00**
List of parts	195.00
Heath Model 2C Monoplane	**$1,000.00**
Complete, list of parts	325.00
Heath Model 2B Tractor Biplane	**$1,450.00**
Complete, list of parts	350.00
Heath Standard Trainer	**$4,275.00**
Complete, list of parts	850.00
Heath Ford Motored Biplane	**$1,375.00**
Complete, list of parts	425.00

TABLE I

GET THESE BARGAINS

Used fur-lined flying suits, good condition	$15.00
Curtiss OX5 pusher propellers	35.00
Jenny wings, newly covered	60.00
Hispano cylinder blocks, right side, good condition	20.00
Hisso "A" and "T" used platons	1.50
Lunkenheimer gas strainers	1.50
Acetate dope, in 5-gallon lots, per gallon	1.00
New inner Hisso "A" connecting rods	12.50
New outer Hisso "A" connecting rods	9.00
Hisso Model "E" hubs, complete	10.00
750x125 wheels, (30x5)	4.95
700x100 wheels (28x4)	2.00
1/32 in. Waterproof plywood, 24x60, full sheets, per sq. ft.	.20
1/16 in. Waterproof plywood, 20x60, full sheets, per sq. ft.	.25
JN or Canuck axles	3.75
JN stabilizer braces	.50
Brown shock absorber, 9c per ft. 100 ft. rolls	6.00
Wicker seats	2.00
1 Standard fuselage with cockpit cowl, seats, and controls	75.00
Complete tail assembly for same	50.00
Complete landing gear for same	40.00
Oil gauges	1.25
Oil gauges in 1 dozen lots	.95
Liberty hose clamps per hundred	.75
Thermometers	5.50
AC Spark Plugs, each	.25
AC Spark Plugs, in lots of 100, each	.20
AC Spark Plugs, in lots of 1000, each	15

HEATH AIRPLANE COMPANY, Inc.

2856 Broadway CHICAGO, ILL.

Figure 3: Heath Ad of aircraft parts and accessories, many surplus from WWI

horsepower the engine let the *Feather* cruise at 45 MPH. Heath planned to sell these planes $1,200 ready to fly, $990 less engine and $250 for the kit of materials to build your own (less engine). The engine could be bought separately for $250. Before Heath could get the *Feather* into production, the bottom dropped out of the airplane market when the U.S. Government released a massive amount of aircraft and aircraft related components onto the war-surplus market.

Just as Howard Anthony would do after WWII, Ed Heath purchased a lot of WWI war surplus including numerous lower wings for the Thomas-Moore ***Scout*** [8] biplane trainer. A lot of extra lower wings were manufactured since they were the part most commonly damaged in training accidents, and the Army had a lot of trainers in use during the war. Besides manufacturing aircraft Heath brokered the war surplus parts at his plant and by mail through magazine ads. Many of the parts acquired were used in-house, as well as being sold retail. **Figure 3** is a Heath Parts Ad (Mar. 1928 ***Popular Aviation*** p. 79) - wheels, tires, and even newly covered Jenny wings for $60! In 1922 Heath used a surplus Jenny fuselage and built a two cockpit biplane, the ***Favorite***. To the fuselage he added custom built wings and propellor. Heath's company had a lot of experience carving propellors. They were a high-profit commodity, especially with his flight school labor source.

Heath at the Air Races:

About the time the second Ford rolled off the assembly line you can bet someone came up with the idea of auto racing. The same could be said for airplanes. Before WWI air racing was more popular in Europe than in America. The first US National Air Races was sponsored in 1920 by publisher Ralph Pulitzer and held at Roosevelt /Mitchel Field on Long Island, N.Y. – now the site of the Roosevelt Shopping Center. The races were held yearly through 1939 at airfields throughout the county, Some races were

based on cross-country flying, and others were pylon racing where a closed course was defined by red and white pylons.

The **1923 Air Races** were held in St. Louis and Heath entered a race for the first time, knowing that a win would be good advertising for his company. He entered his "Favorite" into the "On to St. Louis" cross-country race. This race required a flight of over 200 miles terminating at the St. Louis Flying Field. Points were given for horsepower, number of passengers and of course distance. Heath left from Chicago with four people onboard. The flight was momentarily delayed by engine trouble and a forced landing, but they made it to St. Louis and won third place.

With enthusiasm, Heath took his ultralight"Feather" airplane to the **1924 Air Races** held at Dayton. While these races had many categories for military aircraft, Dayton also offered races for light aircraft. Unfortunately, 1924 was a wash for Heath when his plane couldn't handle the high gusty winds and ended up on its back. Still, Heath learned a lot from viewing the designs of his competitors.

The **1925 Air Races** were held at Mitchel Field on Long Island, N.Y. Heath showed up with a new airplane, the ***Hummingbird*** A monoplane design weighing just 300 lbs with a

19 Years Back of Us

E. B. Heath—Winner in National Air Races, 1927

FROM 1908 to 1927

Years of experience is what counts and not merely big promises

HEATH'S SCHOOL OF AVIATION
not only a school but a real aircraft factory. Directly connected with

THE HEATH AIRPLANE CO.
Oldest in the Business—Established 1908

DAY AND EVENING CLASSES
Work After Class Hours Guaranteed

NOW—You Can Earn While You Learn! A New Opportunity Never Before Offered in the Aviation Field —By an Old Reliable Concern—

Evening Courses Can Be Arranged for on the Deferred Payment Plan.

Our Student Welfare Department Will Assist You in All of Your Problems, Employment and Otherwise.

Heath's School of Aviation
Dept. 51, 2856 Broadway Chicago, Ill.

FIGURE 4: Ad for Heath's School of Aviation from ***Popular Aviation Magazine*** (November 1927 Issue - Page 57). The caption under the photo reads: *E. B. Heath – Winner in National Air Races, 1927.* The plane shown, however, is the Tomboy so the photo must have been taken at the 1926 Philadelphia Air Races.

wingspan of 26' and a length of 16½'. It was powered by a Heath modified Henderson motorcycle engine. Heath had help with the design from Clare Lindstedt who would later help design the *Parasol*. The *Hummingbird* was fast but underpowered and was at a disadvantage around the triangular race course All the competition were using motorcycle engines except one which used a Bristol Cherub II engine with significantly more horsepower. The extra power allowed the plane to accelerate out of the turns faster and quickly outpace the others in the field including Heath's *Hummingbird*.

At the **1926 Air Races** held in Philadelphia, Heath's luck improved. He showed up with his *Hummingbird*, but now renamed the ***Tomboy*** [9] and sporting a Bristol Cherub engine. These engines were expensive at $1,270, but Heath thought it a good investment. Heath won every race he entered and came home with over $2,200 in prize money. It was with this prize money that Heath, with Lindstedt's help, used to build the *Parasol.* a sport plane for the masses.

The **1927 Air Races** were held at Spokane, WA. Heath won both events he entered flying a modified *Parasol* with a new racing wing and using the Cherub engine. (This plane is often referred to as the ***Spokane Parasol*** [10]). Both wins were "last-man-standing" races where the Parasol was the only plane remaining in the air at the end. Still the plane performed well and was fast, garnering it a lot of attention. Lindbergh had recently made his historic flight and aviation was experiencing high popularity. The event was well attended.

The **1928 Air Races** were held at Mines Field. Today Mines Field is known by its current name: The Los Angeles International Airport – KLAX. Heath showed up with a new midget race plane, the ***Baby Bullet*** [11]. With speeds increasing every year Heath, Lindstedt and a few other of Heath's team started construction on a plane they called the ***Wee-Mite***. In the summer of 1928 fire struck the Chicago Heath plant at 2856 Broadway. Heath was able to quickly get new facilities on Sedgwick St. During the fire the *Wee-Mite* was badly damaged and Heath had lost a lot of inventory. However, the *Wee-Mite* was repaired and renamed the *Baby Bullet*, and it was ready for shipment to Mines Field in time for the races. The *Baby Bullet*, with its 75 cubic inch Cherub engine, competed in a class with a 300 cubic inch displacement limit. To everyone's surprise the Heath plane, with its 34 horsepower engine, not only won, but by halfway through the race had lapped the field. And by the finish Heath had lapped the field twice and some of the competition three times!

Heath and his engineers modified the *Baby Bullet* substantially assuming the competition would get tougher at the **1929 Air Races** at Cleveland. One thing they did was reduce the size of the wing to reduce drag. When finally tested, the speed had decreased instead of increasing. The previous wings had been stripped for parts so they couldn't be changed back. Heath took the modified *Bullet* and a new Heath-Henderson powered *Parasol* hoping do their best. Heath planes flew in four races. The *Parasol* won its race and the modified *Baby Bullet* won one race and finished second in the other two. Heath was piloting both first-place wins.

The **1930 Air Races** were held at the Curtiss-Reynolds Field north of Chicago (**Figure 5**). Heath won two races. The Men's 100 cu. in. class in a modified ***Parasol V***, beating two other Heath monoplanes **(Figure 6)** . He also won the Men's 275 cu. in. class in a new design, the ***Cannonball*** [12], using a Heath de-

Figure 5: 1930 National Air Races Poster

signed 200 cu. in. engine that produced around 70 horsepower.

Ed Heath was killed in a flying accident before the **1931 Air Races,** but the company sent the *Cannonball* and two of the latest Heath ***CNA-40 Parasols*** The *Cannonball* won its class and the two *Parasols* came in first and third in their class. The races were held in Cleveland for the second time. It was the last year the Heath Airplane Company officially competed in the Air Races, though one must believe that others flew Heath aircraft in competition. The re-engined *Cannonball* appeared in the 1932 races but finished in 6th place.

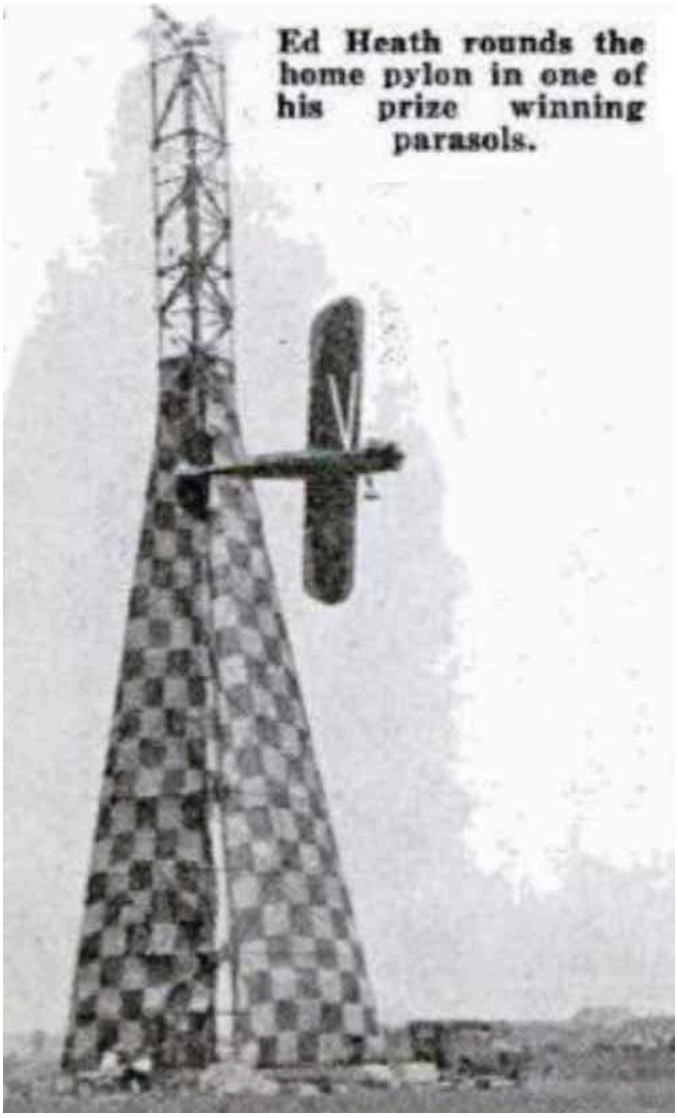


Figure 6: Edward Heath flying a Parasol around the a pylon at the 1930 National Air Races. Photo from Nov. 1930 Popular Aviation (p. 27)

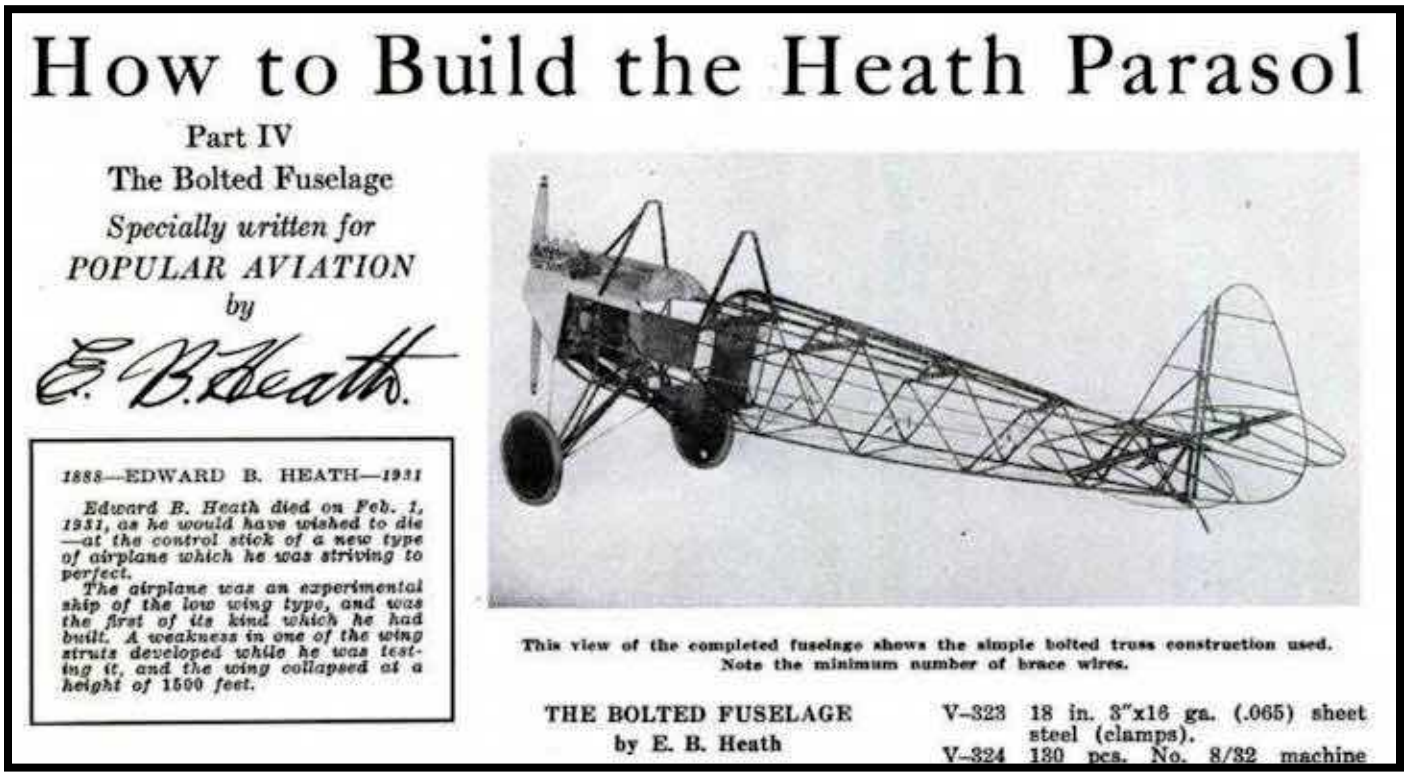
The Death of Edward Bayard Heath:

With the *Parasol* selling well, a friend of Heath's had modified a Heath *Parasol* he had built to a center-wing configuration. This may have resulted in Heath later designing the Heath *Center-Wing* model. Heath then also designed and build a prototype low-wing aircraft **(Figure 7).** This was basically a *Parasol V* model design with the wings attached at the bottom of the fuselage. Two struts from each wing attached to the upper fuselage. Perhaps, unknown to Ed Heath, it is rumored that these new struts were made of aluminum

Figure 7: X10717, the low-wing airplane E.B. Heath was flying when he was killed.

instead of steel. The struts, instead of being in tension, were in compression under positive 'G-load' and if too weak, prone to folding. A good analogy is a length of rope; pull on it and it will be very strong; push on it and it will just fold up.

On Sunday February 1st, 1931 Heath drove to the company airfield at Potter Rd. and Dempster St. in western Morton Grove, IL (Near the current Maine East High School). The prior day, two of Heath's test pilots had taken the new plane up and reported it performed well. That Sunday morning Heath also flew the plane and seemed happy with it upon landing. It was reported he took the crew at the airfield, including the two test pilots, to lunch. After lunch he returned to the airfield and decided to take the plane up once more. Perhaps something was discussed



How to Build the Heath Parasol

Part IV
The Bolted Fuselage
Specially written for
POPULAR AVIATION
by
E. B. Heath.

1888—EDWARD B. HEATH—1931

Edward B. Heath died on Feb. 1, 1931, as he would have wished to die—at the control stick of a new type of airplane which he was striving to perfect.

The airplane was an experimental ship of the low wing type, and was the first of its kind which he had built. A weakness in one of the wing struts developed while he was testing it, and the wing collapsed at a height of 1500 feet.

This view of the completed fuselage shows the simple bolted truss construction used. Note the minimum number of brace wires.

THE BOLTED FUSELAGE
by E. B. Heath

V-323 18 in. 3"x16 ga. (.065) sheet steel (clamps).
V-324 130 pcs. No. 8/32 machine

Figure 8: Part four of a seven part series by Ed Heath that rand in the Dec. 1930 thru July 1931 issues of ***Popular Aviation***

IT BECOMES our sad duty here to record the passing of one of aviation's pioneers. Edward B. Heath died on February 1st while testing an experimental plane.

Ed Heath was our friend. In a larger sense, he was a friend of all those who were sincerely interested in aviation. Heath's work and plans, carried on over a period of twenty years, were in the infancy of their development, and in his case, the industry's loss is far greater than the personal loss we feel.

We might extol Heath's many virtues—his industry, his enthusiasm, his patience, his helpfulness to others, his cooperation and the fine spirit with which he gave his time and advice. But we believe that the finest service we can do for him and the one he would prefer us to do, is to publish the true facts of his death and dispel any false or misleading statements that have appeared in newspaper accounts of the accident.

Heath frequently expressed his disapproval of the low wing type of plane. However, in response to popular demand he designed and built a low wing model and took it out for its first tests on Sunday, February 1st.

In putting this new and untried ship through test maneuvers, one of the wing struts failed and the wing collapsed at an attitude of about 1,500 feet. Heath was instantly killed as the disabled craft plunged to the ground.

From these facts it is evident that any reported "motor trouble" had nothing to do with the case. Furthermore, the plane in question had no relation to the Heath Super Parasol.

The Heath Aircraft Corporation will continue to operate under the present management and will devote all its energies to the production of the parasol which is meeting with such success in all parts of the world.

* * *

over lunch that Ed Heath wanted to check out? He took the plane up and was seen pulling out of a short dive when the right wing collapsed, and the plane fell to the ground. Upon impact Edward Bayard Heath, aged 42, died instantly. The crash and his death were reported in the Chicago Tribune and in *Popular Aviation* **(Figure 9)**

At the time of his death, *Popular Aviation* was running a seven-part series on "How to Build the Heath Parasol". Evidently Heath had already completed the series of articles as they continued to run monthly through July 1931. **Figure 8** shows the header of the fourth installment of the series, including a short announcement of Heath's death.

Sad as Ed Heath's death was, if it hadn't happened the Heathkit Company as we knew it may never have existed.

The Original Heath Parasol Airplane (1926):
With the prize money Heath won in his early air racing days he brought to fruition his desire for a sport plane that would be affordable to the average person. The original *Parasol* was designed in late 1926 and was announced in ***Aviation Magazine*** in its February 1927 issue. The original *Parasol* sold for $575 ready to fly at Chicago. It has a wingspan of 23' 0" and 94 sq. ft. of wing area. It came powered with a Henderson Deluxe Motor (23 hp). Additional specifications are given in **Table III**. The original *Parasol* could be sold so inexpensively because it used a pair of Thomas-Morse *Scout* lower wings that Heath had obtained a quantity of surplus. Newer, more efficient, wing designs had been developed, and that along with the low horsepower and minimal wing area made the plane performance degrade with heavier pilots.

LEFT Figure 9: Heath's death announcement from the April 1931 issue of Popular Aviation pg. 8, "An *Airy Chat* with the *Editor*" editorial column.

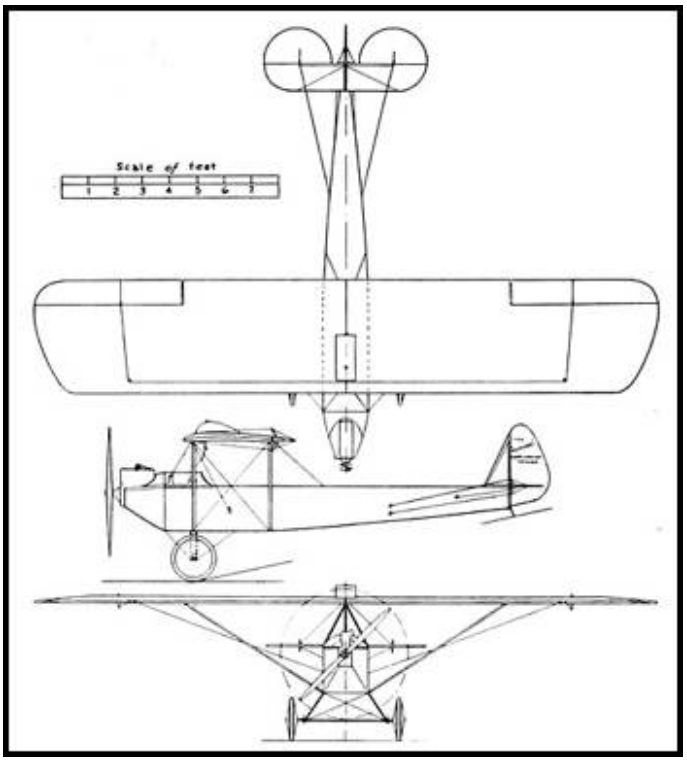


Figure 10: Outline drawing of the Heath Parasol built with the Thomas Morse Scout lower wing. (Aero Digest - March 1927)

The $575 *Parasol* sold, but Heath knew the supply of surplus wings would eventually run out. Also, even at the low price, many people still couldn't afford to purchase the plane. While mention of selling the material to build the original Parasol was hinted at in advertising, no price or offer of such was found by the author in its advertising.

The Super Parasol (1928):

After Heath's racing success in Washington state flying his "*Spokane Parasol*", He knew he had to improve the *Parasol* to keep it viable in the market place. A new wing that was longer, with more surface area and used the Clark Y airfoil cross-section was designed. Heath also began modifying the Henderson motors, resulting in the Heath-Henderson B-4 engine that produced 16% more horsepower. The big drawback to the wing was the added cost. The ***Super Parasol*** sold for $975, almost a 70% increase. This was vastly out of the price range of much of the people the plane was designed for. Heath, cleverly devised a do it yourself time payment plan. He broke the plane's construction into 11 groups, each with detailed plans. You could buy all eleven groups for $199 (no motor). Or if you wanted, you could buy the plane one group at a time. The first group costs under $12, and the most expensive group (group 9) costs under $37.50. The groups are:

1. $11.76 - Wing ribs. You can either build the required jig or buy one for an additional $4.00.
2. $14.01 - Initial wing structure.
3. $10.58 - Wing frame structure.
4. $11.66 - Material to complete the wing (less cover).
5. $12.79 - The complete tail section: Stabilizer, Fin, Rudder, and Elevators, less cover.
6. $22.21 - Fuselage longerons and fuselage front section.
7. $17.61 - Fuselage rear section, completing the fuselage, less cover.
8. $17.55 - Aircraft controls.
9. $37.31 - Landing gear including wheels, tires and tubes.
10. $21.01 - Remaining parts to complete airplane less cover and motor.
11. $30.60 - Material for covering and doping the wings, tails surfaces and fuselage.

Prices shown included the 10% discount offered by Heath Co. from their list prices. Amounts are representative of early pricing.

Builders are warned that *"The parts are not precut and tubing is sold by the foot, cloth by the yard and metal by the sheet"*. In comparison it would be like a later Heathkit coming with a sheet of metal, and you would form the chassis and then drill all the holes.

Heath sold a lot of the first groups and one can imagine that there were a lot of partially

built wings that were collecting in people's garages and workrooms.

One feature Ed Heath developed for these early home-built airplanes was a way to assemble the metal tubed fuselage without the need for welding. Welding was not a skill many people had, and having the fuselage welded professionally was expensive for the home constructor. Heath's method involved joining the ⅝" 20 gauge steel tubing using 20 gauge sheet steel fittings, nuts and bolts and two-penny shingle nails as rivets. Bracing was done with wire and turnbuckles. The design must have worked well as there was no structural problems reported. Heath factory-built planes came with a welded fuselage frame. **Table II** lists the tools Heath Company said were needed to assemble the airplane:

Center punch	Hand Drill
Chisel	Pliers
File	Rule
Hacksaw	Screwdriver
Hammer	

Tools Listed as Required for Assembly

Table II:

The V Parasol (1930):

The *V Parasol* (figure 1) was another advancement to the Parasol line. It added easily removable wings for storage and towing behind a vehicle on the road, a door for easier access to the cockpit, a skylight in the center of the wing allowing a sight-gauge for the fuel tanks and, if bought assembled from the factory, a fully welded Warren truss fuselage frame. The 'V' title for this model came from the new V-shaped wing struts. Up to the model V, all the Parasols came with landing gear that had a single axle connecting the wheels as depicted in **figure 10**. Either many people updated their landing gear or the model V was the first to use split-axle landing gear as shown in **figures 1 & 8**. The home-built Heath *Parasols* were often modified by the builder, and other than using a different motor, one common modification was to change to split-axle landing gear.

The *V Parasol* was very popular and many material kits were sold. It was the model covered in Heath's 7 Part "*How to Build a Parasol*" article. (**Figure 8**). Its specifications are also given in **Table III**.

In the early 1930s the state and federal government were beginning to regulate private as well as transport aviation. To fly a small plane for profit between states after rules went in to effect required that the plane be certified. Many states followed the feds rules. Some states actually outlawed, for a time, flying in a home-built airplane unless it went through a certification process which was expensive for the builder.

The Certified Heath Parasols:

About three months after Ed Heath's death the company was put up for sale. It was purchased by Gen. John Clinnin and his brother Walter. John was a lawyer who had helped Ed Heath incorporate the previous year. The company was now called the Heath Aviation Corporation. The plant was moved to Niles, MI about 70 miles east of Chicago. Staff was reduced and a new head was hired, Fred Seiler. Fred made the decision to get the Heath *Parasol* certified. Heath Co. developed two new *Parasol* models over the next two years. The 1931 Heath ***LNB-4*** with Approved Type Certificate (ATC) 456 and the 1932 Heath ***LNA-40*** with ATC 487. The two aircraft are almost identical with the exception of the power plant. The *LNA-40* uses a more powerful Continental A-40 engine. Both are heavier by almost 200 lbs., and both now use an 'N' configuration for their wing struts.

Heath LNB-4 Parasol:

The *LNB-4 Parasol* received its ATC in mid-December of 1931. The biggest hurdle was getting the engine type-accepted. When introduced, the LNB-4 **(Figure 11)** was the least expensive certified airplane in the world. This plane, being heavier, was not a good performer. Heath didn't sell many factory models. It had a service ceiling of only 9,000 feet and an initial climb rate of 350 ft/min. However, the kit version (do be discussed later) evidently sold well.

Figure 11: The LNB-4 Certified Parasol.

Another problem affecting the LNB-4 was that Henderson stopped manufacturing motorcycles in mid-1931, and the source for the engines Heath was modifying to make the B–4 engine would soon dry up.

Heath LNA-40 Parasol:

Continental, a large aircraft engine company, had recently developed an engine for small aircraft. The A-40 produced about ⅓ more horse power (37 hp.) than the B–4 engine. It was also reasonably light (145 lbs.) and reliable (especially after Continental fixed a few early problems).

Other than the engine, the two biggest changes were that the door was moved from the left side of the fuselage to the right, and a baggage compartment was added in the headrest, placarded for only a 4 lb. capacity. The door change was required since the Heath B–4 engine turned in the opposite direction. When starting the engine by propping the propeller, the door needed to be on the side that gives easiest access to the engine controls. The higher performance LNA-40 had a service ceiling of more than 16,000 ft. and an initial climb rate of 500 ft/min.

The First Heath Kit:

Up until the *LNB-4 Parasol* all the kits offered was just the raw materials along with blueprints and instructions. However, if factory approved parts were used, a home builder could get his plane certified if the work was done under the supervision of a CAA representative. As a consequence Heath offered two kit forms for the CNB-4 [13]. The first included factory welded fuselage and tail surfaces. The wings still required fabrication. In its literature Heath called the new kits **"The Big New Heath Construction Kit Complete"**. Added to the brochure was the following additional paragraph describing the second kit form:

NOTE: These are construction kits which the customer does a portion of the building. Therefore it is impossible to license this type of kit. However, Heath Airplane Company produces a line of assembly kits which are licensable… The licensed assembly kits are supplied with the ribs constructed, the drilling and welding being done, leaving the work for the purchaser that of assembling the various sections. This kit sells for approximately twice the amount… If you require a licensed kit write for the Model LN CN Booklet.

This certifiable kit is probably the closest to the Electronic Heathkits that were so popular between the late 1940's and the early 1990's.

A bit more Heath History:

Without Ed Heath's leadership, and with the country still under the effects of the depression, financial problems grew. In 1933 Heath changed its name to the International Aircraft Corp. but wasn't selling many planes. Bankruptcy followed, and Howard Anthony was called in by the Feds to inventory stock.

HEATH PARASOL MODELS and their SPECIFICATIONS

Specification:	Parasol	Super Parasol	V Parasol	LNB-4 Parasol	LNA-40 Parasol
Overall Length:	16’ 9”	16’ 9”	16’ 9”	17’ 3”	17’ 3”
Height:	5’ 10”	5’ 8¼”	5’ 8¼”	6’ 0”	6’ 0”
Wing Span:	23’ 0”	25’ 0”	25’ 0”	31’ 3”/ 37’ 6” **(a)**	31’ 3”/ 37’ 6” **(a)**
Wing Chord:	4’ 3”	4’ 6”	4’ 6”	4’ 6”	4’ 6”
Wing Area:	94 sq. ft.	110 sq. ft.	110 sq. ft.	135.5 sq. ft.	135.5 sq. ft.
Airfoil:	Morse	Clark Y	Clark Y	Clark Y	Clark Y
Empty Weight:	260 lbs.	260 lbs.	260 lbs.	450 lbs.	n/a
Gross Weight:	545 lbs.	560 lbs.	560 lbs.	675/700 lbs. **(b)**	700 lbs.
High Speed:	70 mph	70 mph	85 mph	73 mph	80 mph
Cruise Speed:	n/a	56 mph	66 mph	62 mph	68 mph
Landing Speed:	32 mph	28 mph	28 mph	32 mph	32 mph
Range (c):	120 s mi.	120 s mi.	120 s mi.	215 s mi.	200 s mi.
Fuel Quantity:	3.3 gal.	5 gal.	5 gal.	9/10 gal.	9/10 gal.
Oil Quantity:	3 qt.	3 qt.	3 qt.	6 qt.	6 qt.
Power Plant:	H. D. L. **(d)**	H-H B4 **(e)**	H-H B4 **(e)**	Heath B-4 **(e)**	Continental A-40
Horse power:	23 hp	25 / 27 hp. **(f)**	25 / 27 hp. **(f)**	27 / 30 hp. **(f)**	37 hp.
Year Introduced:	1926	1928	1930	1931	1932
Price (ready to fly):	$575.00	$975.00	975.00	$1,074 / $925 **(g)**	$1,224 / $1,085 **(h)**
Price (kit) (x):	n/a	$199.00	$199.00	$499.00 **(j)**	n/a

(a) Standard wing / High Altitude Wing
(b) Early / Late production model
(c) Statute miles
(d) Henderson De Luxe engine
(e) Heath Henderson 4 cyc. engine.
(f) Max. continuous / Takeoff power
(g) 1931 / 1933 prices
(h) 1932 / 1933 prices
(j) 1931 price

TABLE III

Anthony ended up buying the company. He took back the Heath Airplane Company name and with his wife was able to keep the company running, first by selling off old inventory and then producing specialized aircraft parts. First tail wheels and then whole tail wheel assemblies. He started selling numerous aircraft parts including windshields, cockpit communications for trainers and yes he designed and sold an aircraft radio [I had to work radio into the story somewhere!]. Howard Anthony moved the compa-

We Have Money!

OCARC Cash Flow - Year To Date

1/1/2020 through 4/4/2020

Category	1/1/2020-4/4/2020
INFLOWS	
Auction In, Jan 2020	1,696.25
Cash Box Deposit	140.00
Donation - Michael K6GTE	30.00
Donation - N6GP	20.00
Dues, Family (PayPal) 2020	86.78
Dues, Membership (PayPal) 2020	893.73
Dues, Membership 2020	508.83
Refunds Received	15.53
TOTAL INFLOWS	**3,391.12**
OUTFLOWS	
Auction Payout, Jan 2020	1,359.23
Donations - Red Cross	250.00
Field Day Winter - Tent Rental	130.00
OCARC Historian	29.29
Opportunity Drwg - Monthly Exp	438.71
Refreshments Expense	32.65
Storage Locker	285.00
Supplies	15.85
Trifold Auction Printing	21.55
Web Site Hosting	101.94
Web Site Hosting - PayPal	19.00
TOTAL OUTFLOWS	**2,683.22**
OVERALL TOTAL	**707.90**

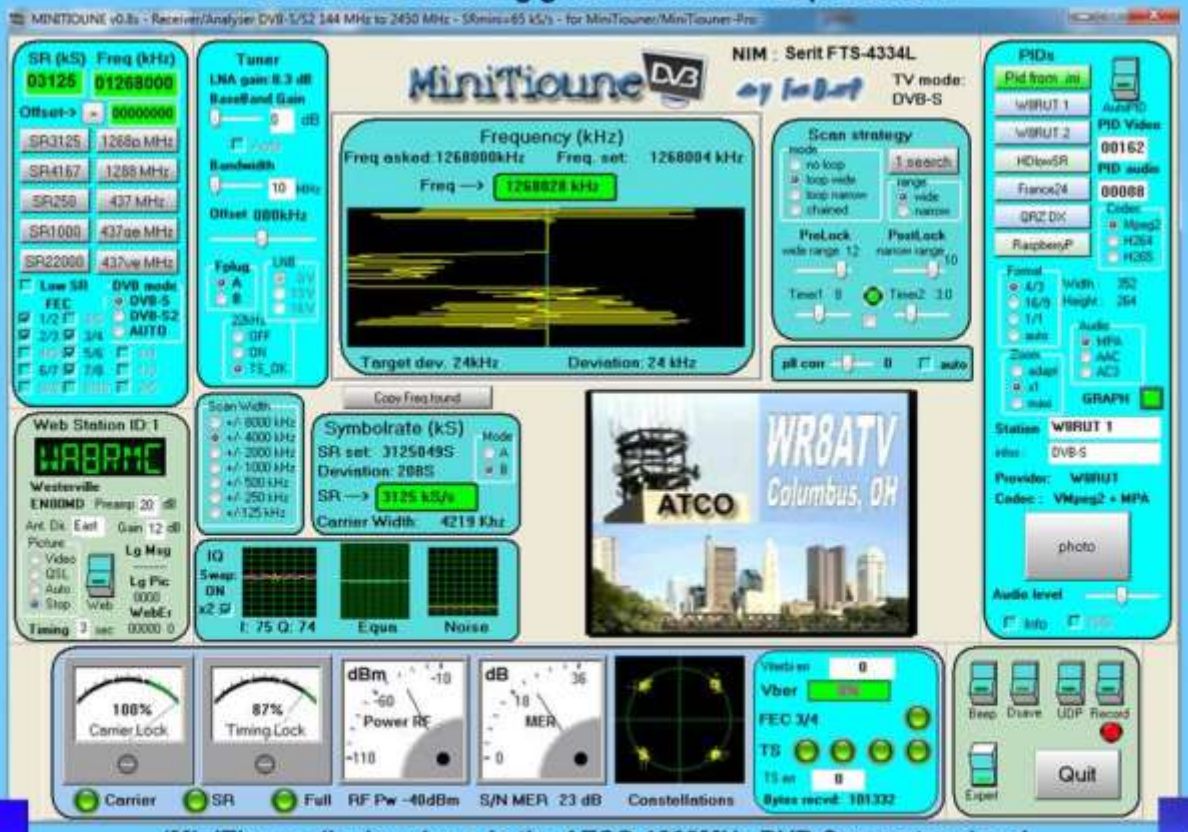
MiniTiouner-Express

Digital Amateur Television DVB-S/S2 Receiver / Analyzer

Available at DATV-Express.com

- Operates with Windows PC using free MiniTioune software from Jean-Pierre F6DZP
- Smaller than a stack of 2 decks of cards (picture above is full size)
- Two independent simultaneous RF inputs with internal preamps
- High sensitivity -100dBm @1288MHz – at 1/2 FEC
- Fully assembled/tested in aluminum enclosure
- Covers 144-2420MHz (ideal for Space Station DATV reception)
- Symbol rates from 75 KSymb/s to >20 MSymbols/sec
- Uses external 8-24VDC supply or +5V from USB-3 port (with small modification)
- Real time signal modulation constellation & dBm signal strength display
- Price: US $75 + shipping – order with PayPal

For details & ordering go to www.DATV-Express.com



(MiniTioune display above is the ATCO 1268MHz DVB-S repeater signal at WA8RMC QTH 15 miles away).